

but of a tint not familiar to me, in the western horizon, extending from the north-west to a point near the South Pole. The centre of the mass was about due west, and was there some 25° above the horizon. There was no wind; there were no cirri. The sky was clear and the air transparent, and I could not associate the appearance with anything like a "cloud-glow." It seemed to me like the blaze of a great conflagration seen through a smoky medium, and I expected every moment to see the fire-engines rush past me. At dark (6 p.m.) there were long pallid streaks of polar auroral light, proceeding from a centre in the north-west. These presented no signs of the flickering activity usually accompanying auroral manifestations. Soon after 7 p.m. all traces of polar aurora vanished. It may be mentioned that, while instances of aurora have been common here throughout the autumn, on one occasion only have flashing rays and beams been present.

Every sunset since the 9th, when the condition of the weather permitted—somewhat rarely—the remarkable glow under notice has been visible in the west, sometimes marked and prominent, as on the 17th inst., at others somewhat indistinct, according as the state of the atmosphere served.

Here to-day, after the storms of yesterday, blue sky prevailed, and the afternoon proved favourable for observation. The sky was clear; the air, washed by frequent rains, was transparent; wind south-west and tranquil; barometer low; thermometer at 2 p.m. 48° . At 4 p.m. a great arc like bank of dusky coloured vapour, extending as before from north-west to south, was discernible. On the sun declining behind the mass, it was suddenly shorn of its beams, and looked like the moon when rising. In a few minutes the vaporous bank assumed the peculiar vivid ruddy hue distinctive of the phenomenon; the blue colour of the sky changed to green. The green was speedily replaced by the ruddy tint before described, which presently suffused the whole hemisphere, tinged the entire landscape, and presented an appearance of which I have never seen the like. The colour was deeper round the horizon than at the zenith. The colour gradually faded as the vaporous glowing mass sank in the western horizon, and at 5.30 had left no trace.

Worcester, November 26

J. LL. BOZWARD

P.S.—The atmospheric effect described as cloud-glow was visible here to-night. There was a cloud canopy, but at 4.30 the ruddy light was visible under the canopy over the whole hemisphere. The ruddy light was manifest in a marked manner at sunrise on the 24th, and was discernible this morning. Probably the phenomenon is attributable to the aqueous vapour in suspension in the atmosphere.

Worcester, November 27

J. LL. BOZWARD

THE remarkable cloud-glow after sunset on November 9 was seen by me at Sudbury on the southern border of Suffolk. I was struck by the softness and uniformity as well as brightness of the glow, and by its contrast with the pale greenish hue of the clear sky around, from which it was separated by a frame of nearer clouds in shade. When I first noticed it the (upper) margin was about 15° above the horizon (estimated from memory). Presently the glow diminished in brightness and increased in extent upward to about 40° above the horizon; and at the highest (nearest) part the delicate structure of the cirrus was visible.

Was it noticed at any place further north than Sudbury?

Wordbridge, November 25

HUBERT AIRY

IN travelling up from Leeds on Monday afternoon I was able to watch the whole progress of the remarkable sunset sky on that afternoon. The sun went down quite clear, and the sky was all but cloudless. Shortly after sunset a crimson arch appeared stretching from south-east to north-east, with a very clear greenish blue sky beneath it in the east. This crimson arch gradually proceeded westwards over the sky, and at about 4.20 was stretching from south-west to north-west. At this time it developed a number of well-defined, pointed rays or streamers radiating from the point where the sun was below the horizon. Between the arch and the western horizon was a sky of a bright silver-white colour, which was so brilliant that it gave us quite a second daylight. The crimson arch continued to sink towards the western horizon, the streamers still retaining the same relative positions. At about 4.40 it formed simply a bright crimson band along the western horizon, and the streamers still pointing out from it gave the appearance of some large forest on

fire in the west. Finally, at 4.50, when we were some twelve miles north-west of Nottingham the crimson arch had entirely vanished below the horizon. At one time, when the arch was at its brightest, with the silver-white sky beneath it, it had exactly the appearance of the aurora, except that the streamers remained fixed in relative position. In the silver-white sky there seemed to be a very thin cloud layer.

A. TARN

31, Mornington Road, N.W., November 27

OPTICAL phenomena of a peculiar nature appeared here on the 25th and 26th inst. On the 25th, shortly before sunset, the atmosphere, which was exceedingly clear except in the west, was suffused with a brilliant tint of lake. Over and to the left of the sun, which appeared to shine with a remarkably white light, there was a heavy cumulus, the edges of which were tinted with a strange, olive-green colour. After sunset the sky in the east became gradually of a more brilliant rose tint, which continued a long time after the sun's rays ceased to be reflected from a long, curled streak of cirro-filum, at an altitude of 2600 feet. The sky nearer the zenith at 5 p.m. appeared to be of a sea-green tint. A little later, the most brilliant rose-coloured glow covered the western and south-western sky, which continued up to about 5.45 p.m., and might easily have been mistaken for a red aurora.

On the 26th a similar phenomenon took place upon a grander and more unusual scale. At 3 p.m., when the sky was totally devoid of higher cloud, the sun, which was shining with a remarkably white light like the electric light, was surrounded by a very broad halo of a uniform pale pink colour, whose exterior margin was very ill-defined. This halo was of about 22° radius and was totally devoid of the usual prismatic tints. A little before sunset the sky, which was clear except in the distant south-west, where there was a thin bank of cirriform cloud, became of a bright salmon colour. At 4.35 there was a beautiful display of *rayons du crépuscule* in the east-north-east, there being six larger and some smaller lake-coloured belts. But the most splendid phenomenon was yet to come. From 5.5 to 5.15 p.m. a brilliant arc of red light having the position of the sun for its centre, and having an altitude of about 25° , illuminated the western heavens. This light was bright enough to cast a vivid red glare on all objects seen in the opposite direction. From this arc throughout the whole of its extent arose bright rays of red light, divergent from the sun's position, the perpendicular one in the centre extending nearest to the zenith. The arc gradually sank towards the horizon, following the sun's westward declining course.

The barometer at the time was very low, the temperature high, and there was marked "visibility." To-night (27th) there is again a red glow, seen feebly through a thick sheet of cirriform cloud.

Is it possible that particles of ice-dust carried upwards to a great altitude in the extensive cyclonic disturbances now prevalent may have produced these phenomena? In any case it seems clear that the reflecting matter was in the first case very equally diffused, having no tendency to arrange itself in strips or cloud-lets; in the second place of considerable vertical thickness; and thirdly, that its greatest altitude was upwards of thirteen English miles.

I hope that some of the readers of NATURE who have witnessed these phenomena may be able to explain them, and not least of all the pink halo.

ANNIE LEV

Asby Parva, Leicestershire, November 27

IN connection with different singular atmospheric phenomena noticed lately in India, Ceylon, and even in our own country, I think an extract from a letter received by the last Cape mail may prove of interest to some of your readers. I may premise that my correspondent resides upon an open Karoo plain, where the atmosphere is always clear; such a "phenomenon" as a fog being unknown, and where the sunsets generally are of a beauty that I have not seen surpassed even in the tropics, a beauty, however, very evanescent, for it will be remembered that in those latitudes there is little or no twilight.

The letter is from about thirty-five miles south of Graaff Reinet, and is dated October 21. "Many of us out here are much interested in a very peculiar light visible in the west nearly every evening about an hour after sunset. It lasts until quite dusk, and throws a sort of lurid glare over everything, and the sky is angrily red; I have not seen anything about it in the

papers, but the people were very full of it in Graaff Reinet. It is now about a month since we first noticed it."

M. CAREY-HOBSON

Pons' Comet and Meteors.—The Quadrantids

I SEE in Greg's list of possible cometary radiant points there is one given for Pons' Comet, the date December 6, radiant point R.A. 200°, N.D. 68° 5'. The radius-vector of the comet at its descending node is 0.77, so that the likelihood of a shower of meteors seems very small; but it might be worth while to look out for one on the 6th of next month.

Pons' comet was just visible to my naked eye on the evening of the 19th—visible only by rare glimpses. On the 20th it was easily visible with the naked eye, almost steadily, so that it would be about of the 7th magnitude. Its tail is still very faint with a 4½-inch refractor, and grows very slowly.

I would call the attention of observers of meteors to the favourable circumstances attending the next shower of quadrantids, as regards absence of moonlight and the convenient time at which the maximum will be reached. On the other hand, the radiant point will be low at that time, thus diminishing the number of meteors visible. I have examined my observations of this shower in 1859, and from 1872 to 1883, and find that the maximum takes place when the sun's longitude is nearly 282°. This will correspond at the next apparition to the middle of the night of January 2. The duration of the activity of this shower is short compared with that of some other periodical showers, and I am making a more minute calculation of it, the result of which I purpose sending to the *Astronomical Register*.

Sunderland, November 27

THOS. WM. BACKHOUSE

Meteor

A REMARKABLE meteor appeared in the eastern sky this evening at about 8.30. Coming out of *Cetus* it travelled slowly towards *Orion*, being visible for five or six seconds. The head was rounded in front, about one-eighth of a degree wide, tapering backwards to the length of half a degree, distinctly bluish in colour, and leaving an indistinct trail of about twice its own length behind it. It was so bright and seemed so near that I took it at first for a firework of some kind. But it was undoubtedly a meteor. It died out silently, and without breaking up, at about 15° from the horizon.

F. T. MOTT

Birstal Hill, Leicester, November 20

Some Habits of Bees and Humble-bees

HAVE any of your readers noticed, or can any account for, a curious practice which I observed on several fine days this autumn among the humble-bees that frequented a bed of blue salvia, viz. that in piercing the calyx and upper end of the tube within it, they would invariably attack it on its *right-hand side*, i.e. the right side of the flower as it looks straight out from the stem. After having several times counted fifty or sixty such attacks in succession, I gathered a number of flowers at random and, carrying them indoors, requested my brother to lay each on its side, so as to show the hole uppermost; twenty-five out of twenty-six were without hesitation placed with the *right* side exposed, the remaining one was considered doubtful. The apparent rule of proceeding was this:—The bee alights on the under midrib or keel of the calyx, with her head towards the stem, then turning her head and fore feet slightly round to the right, inserts her proboscis just clear of the rib, the process being visible only to a person standing on that side of the flower. Whether the flower was on the north or south side of the bed, in shade or sunshine, made no difference, nor did it matter in which direction the bee was making her circuit round the bed. Where two flowers hung so close together as to touch, after piercing the right-hand one on its outer side, and satisfying herself that she could not conveniently push her way in between the two, she would fly off to another, losing the honey rather than attempt to reach it through the left side of the flower. This occurred repeatedly.

Is there anything in the structure of the calyx or in the position of the nectar that can explain this? Or is there a right and left-handedness in some families of humble-bees? Or can it be that a habit, perhaps accidentally established, may be rigidly pursued for a time, at the risk of occasional small losses, to be afterwards abandoned when the impulse is worn out, or when the results are found to be not worth the trouble of form-

ing the habit? That small gains are sometimes neglected in obedience to a habit of quite recent formation, I had an instance a few summers ago, when watching a number of hive bees on a plant of common fuchsia. The greater part of its flowers had been pierced in the upper tube (probably by humble-bees), and my attention was drawn by the regularity and exactness with which the bees were flying straight to the tube, contrary to their usual practice of entering from below. But the flowers were not *all* pierced; and this was the curious part: when a bee had run round the tube and ascertained that there was no hole, she would give it up at once and fly to another, as though the pressure of the new habit would not permit any occasional recurrence to the good old-fashioned plan of entrance from below. Can blind obedience to an *order* given out by a superior have any place in apiary economy?

In this instance it was clear that the habit was fully formed, as regarded that particular plant: I tried to witness its commencement on another, and accordingly pierced as many flowers as I could reach on a fuchsia growing at some distance from the first. A few bees discovered my holes and made use of them, after which they showed considerable hesitation and confusion in their mode of attack, losing much time in hovering up and down as though thrown out of their usual routine; while on unpierced neighbouring plants the customary precision of aim at the lower opening of the corolla prevailed without interruption.

Reverting to the humble-bees on the blue salvia. That their piercing the flower *at all* is an occasional and not universal practice I am inclined to believe, from the totally different behaviour of a set of *apparently the same species* (though of this I cannot be certain) on the same plants during the early part of last autumn. Alighting on the lower lobe of the corolla and advancing inwards, the bee's weight forced open the throat of the flower, into which she then easily inserted her head. This plan was pursued with as much regularity as the opposite one was this autumn. On the same days it was amusing to observe the many fruitless attempts of hive bees to effect an entrance in the same manner. Their bodies being too light to weigh down the floor of the corolla, they would try in vain to force their heads in and always had to fly away disappointed, except when one more fortunate than the rest discovered a flower that had dropped from its calyx, when she would eagerly insert her proboscis into the open end of the tube.

Seeing their great anxiety to obtain salvia honey, I eventually expected to find them taking advantage, this year, of the holes ready made for them by the humble-bees, but strange to say they appeared to have quite deserted the plants, though swarming on a neighbouring bed of yellow *Tagetes*, an occasional wanderer only passing amongst the blue flowers, and without alighting.

ISABELLA HERSCHEL

Collingwood, Hawkhurst, November 21

Rudolphi's Rorqual

IN a communication made to the Zoological Society on the 20th inst., when describing a specimen of Rudolphi's Rorqual (*Balenoptera borealis*), lately captured in the River Crouch, Essex, I said that this was the first well authenticated example of this species taken in British waters. My friend, Mr. J. E. Harting, has kindly called my attention to a paper which had for the time escaped my memory, published by Prof. Turner in the *Journal of Anatomy and Physiology* for April, 1882, in which a specimen is described which was captured near Bo'ness in the Firth of Forth in September, 1872, and of which the skeleton is now preserved in the Anatomical Museum of the University of Edinburgh.

W. H. FLOWER

November 22

Reflection of Light

AS showing how far under favourable conditions the reflection of light from a cloudy sky is visible, I may perhaps be allowed to mention that last night at nine o'clock the reflection of the London lights was remarkably strong. The sky was uniformly covered by a dense canopy of moderately high cloud, and the air very moist (humidity 95). Under such circumstances I have frequently seen at the same time the reflection of the London Brighton, Eastbourne, Hastings, and Tunbridge Wells lights, but last night this reflection in the case of London was peculiarly strong. In former years the light was of a reddish yellow, as is still the case with the lights of the other places named. But